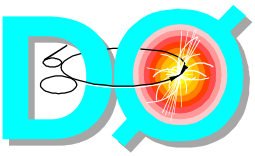


Management & Technical Status

H.Weerts

Introduction/overview

Management & organization

Technical status of detector

in numbers & graphical form

DoE Review
June 1999

Introduction/overview

Original work started on Run II detector in 1990

DoE reviews:

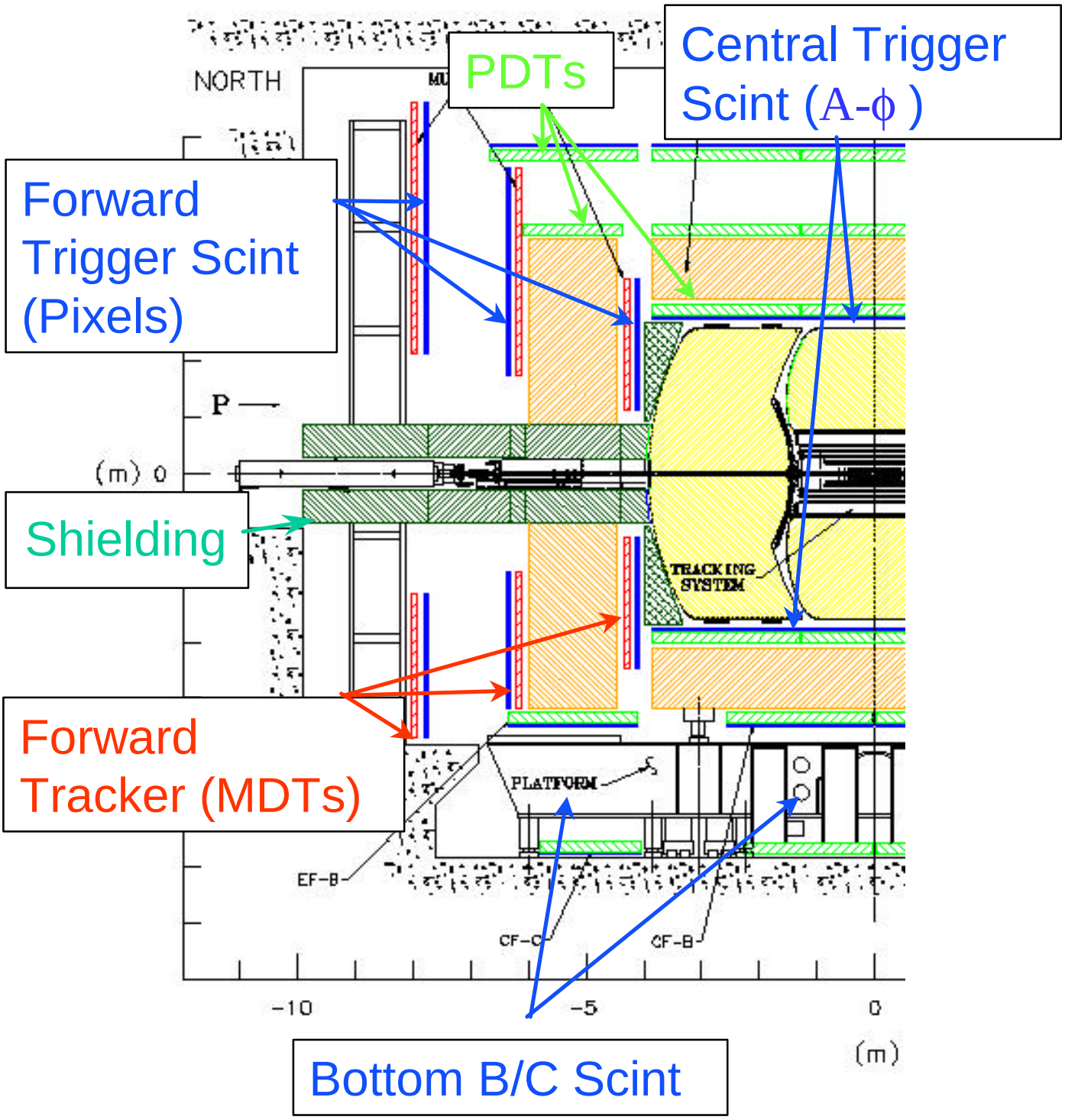
- March 1997
- January 1998, baselined at this review, PMP
- August 1998, mini-review

Project Management Plan from January 1998 review.

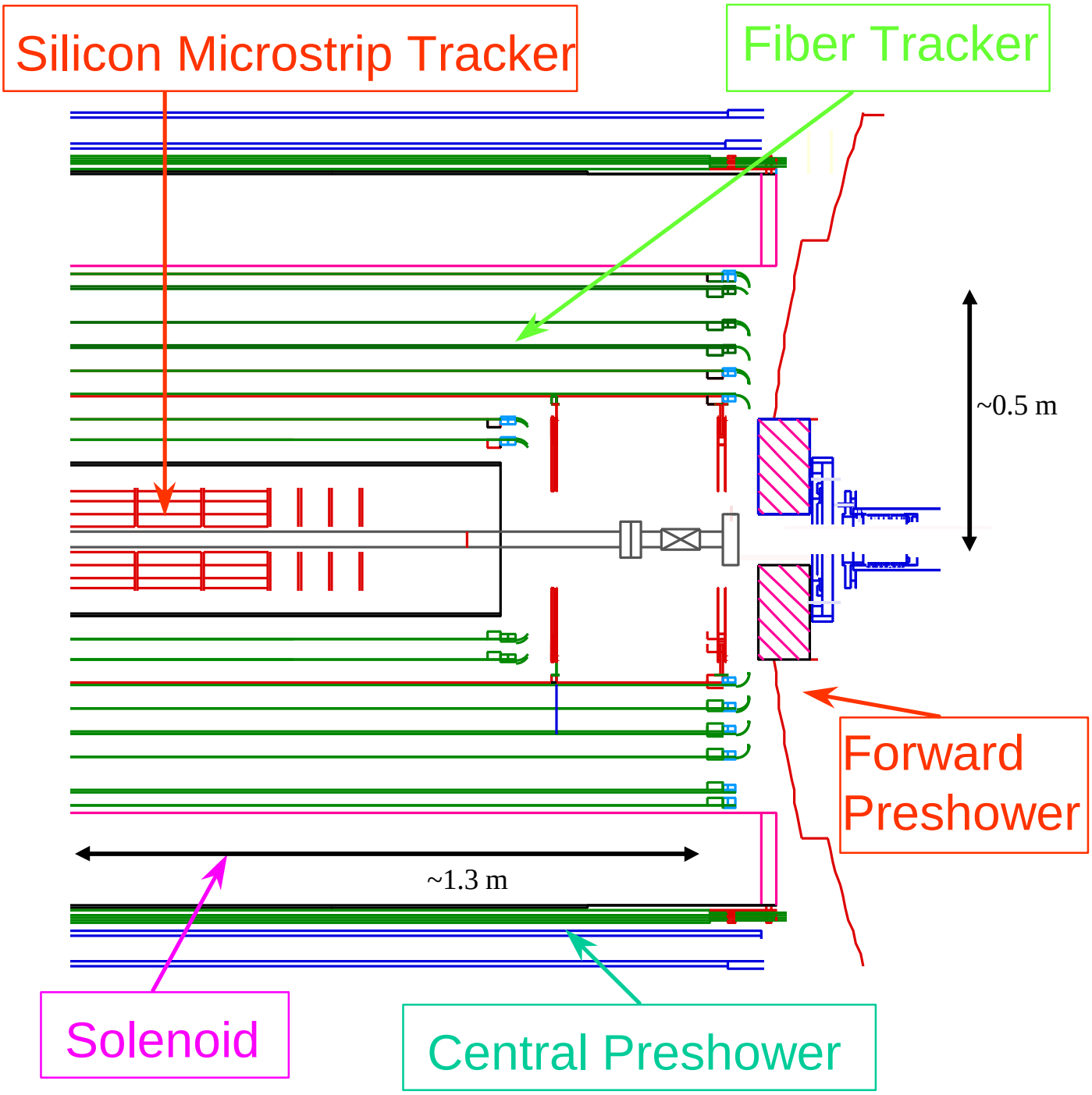
Written answers to questions from January '98 review supplied.

Overview of the Run II detector

Muon Detector Upgrade



Tracking System Overview



All detectors in this volume use SVX II readout

WBS summary

1 DØ Upgrade Detector
- 1.1 Tracking Detectors
  - 1.1.1 Silicon Tracker
  - 1.1.2 Fiber Tracker
  - 1.1.3 Central Preshower Detector
  - 1.1.4 Forward Preshower Detector
  - 1.1.5 Tracking Electronics
- 1.2 Calorimeter
  - 1.2.1 Front-end Electronics
  - 1.2.2 Intercryostat Detectors
- 1.3 Muon Detectors
  - 1.3.1 Cosmic Ray Scintillator
  - 1.3.2 Central Trigger Detectors
  - 1.3.3 Forward Trigger Detectors
  - 1.3.4 Forward Tracking Detectors
  - 1.3.5 Front-end Electronics
- 1.4 Trigger
  - 1.4.1 Framework
  - 1.4.2 Luminosity Monitor
  - 1.4.3 Level 1
  - 1.4.4 Level 2
  - 1.4.5 Level 3
- 1.5 Online Computing
  - 1.5.1 Online Equipment
  - 1.5.2 Level 1 and 2
  - 1.5.3 Level 3
  - 1.5.4 Configuration and Run Control
  - 1.5.5 Data Logging
  - 1.5.6 Control/Monitoring
  - 1.5.7 DAQ Monitoring
  - 1.5.8 Event Monitoring
  - 1.5.9 Calibration
  - 1.5.10 Accelerator Interface

Offline Computing NOT Part of Detector Upgrade Project

2 Detector R&D

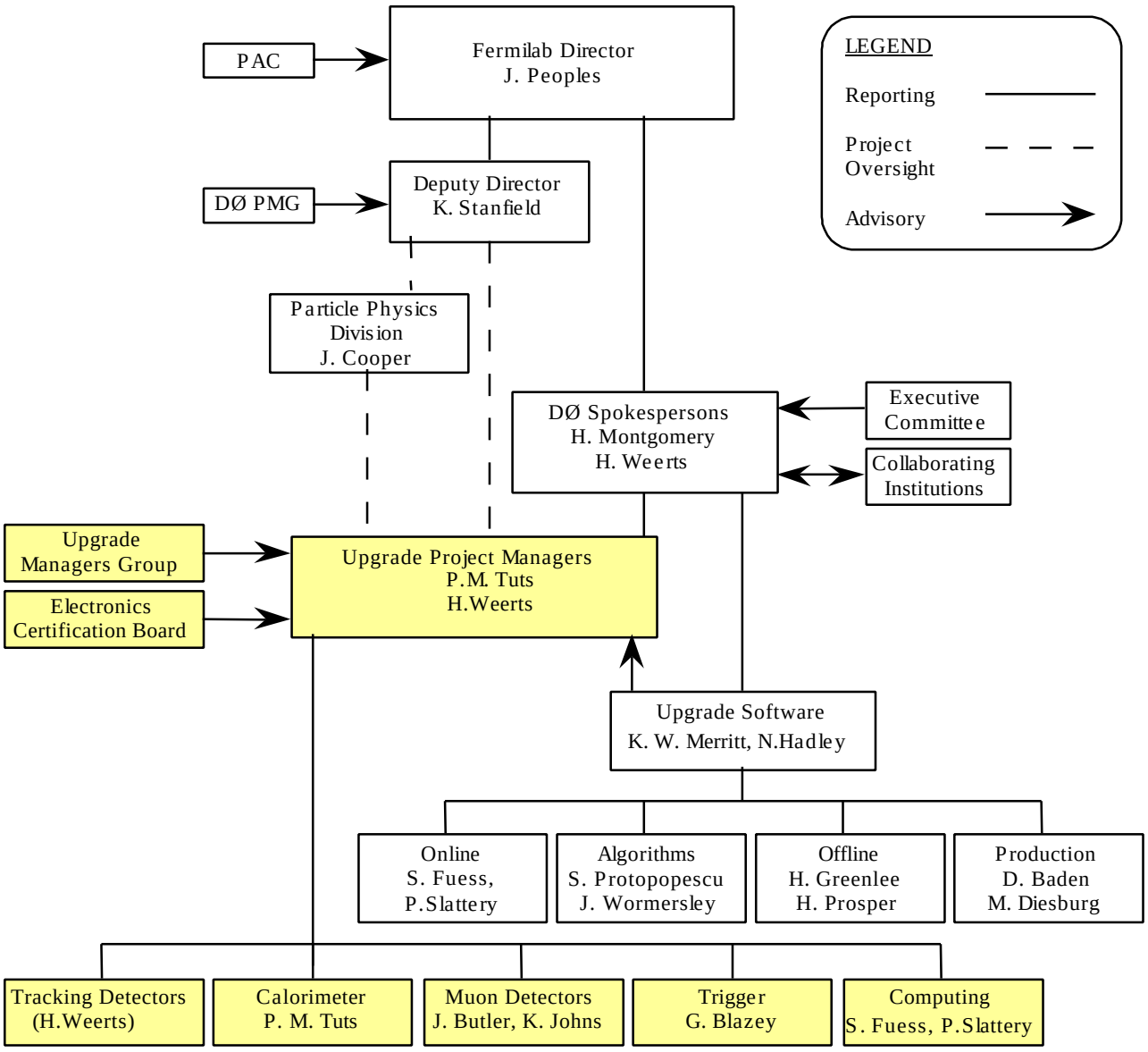
3 AIP Project
- 3.1 Solenoid
  - 3.1.1 Solenoid
    - 3.1.1.1 Management/EDIA
    - 3.1.1.2 Superconducting Solenoid
    - 3.1.1.3 Fermilab Cryo, PS, etc.
    - 3.1.1.4 LHe Refrigeration System
    - 3.1.1.5 Accelerator Machine Modifications
    - 3.1.1.6 Accelerator Services Modifications

Includes Muon Shielding and Beam Pipe

Funded differently

4 Project Support
- 4.1 Project Management
- 4.2 Fermilab Technical Support

D0 reporting structure



DØ Upgrade Project Organization

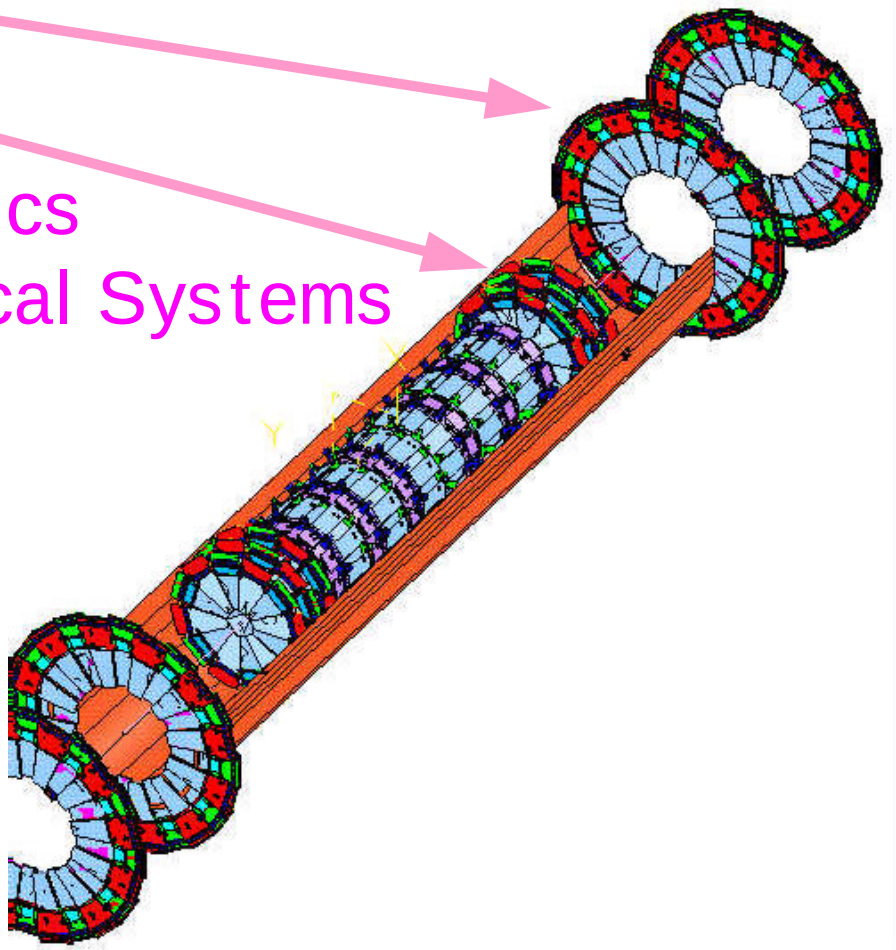
Notes on organization chart

- Silicon and Fibers “Level 2” projects.
- Installation/commissioning historically within each subproject.
- Now have coordinators for these activities, but no separate WBS structure
- Tuts & Weerts divided responsibilities:
  - **Tuts: Calorimeter, Trigger, Online**
  - **Weerts: Tracking, Muon**

D0 SMT overview

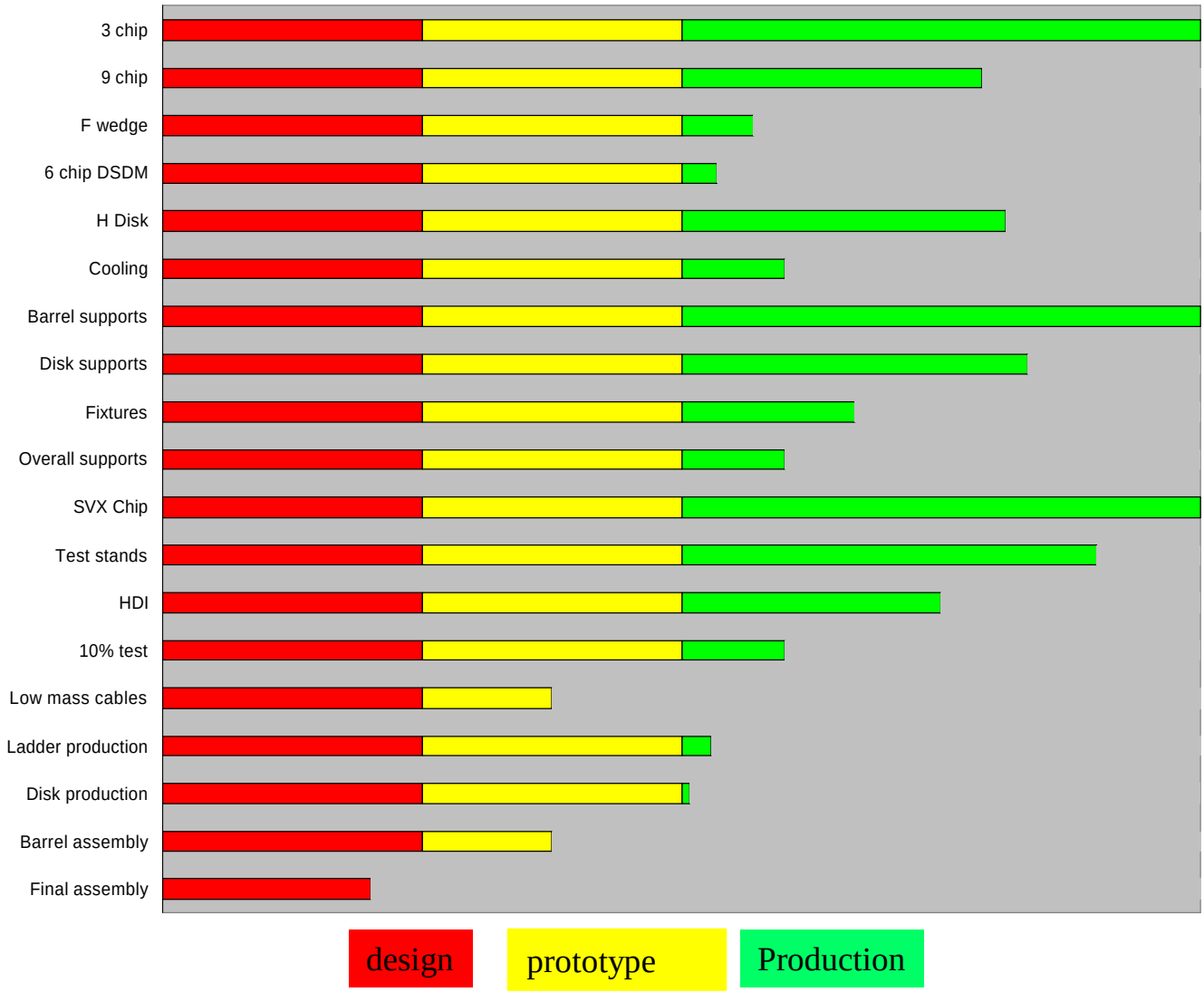
Major SMT Subsystems

- Single Sided Ladder (3 chip)
- Double Sided 2° Ladder (9 chip)
- Double Sided 90° Ladder (6 chip)
- H Disk
- F Disk
- Electronics
- Mechanical Systems



Silicon Status

In production on nearly all aspects



Issues:

Delivery of sensors from Micron/Eurisys

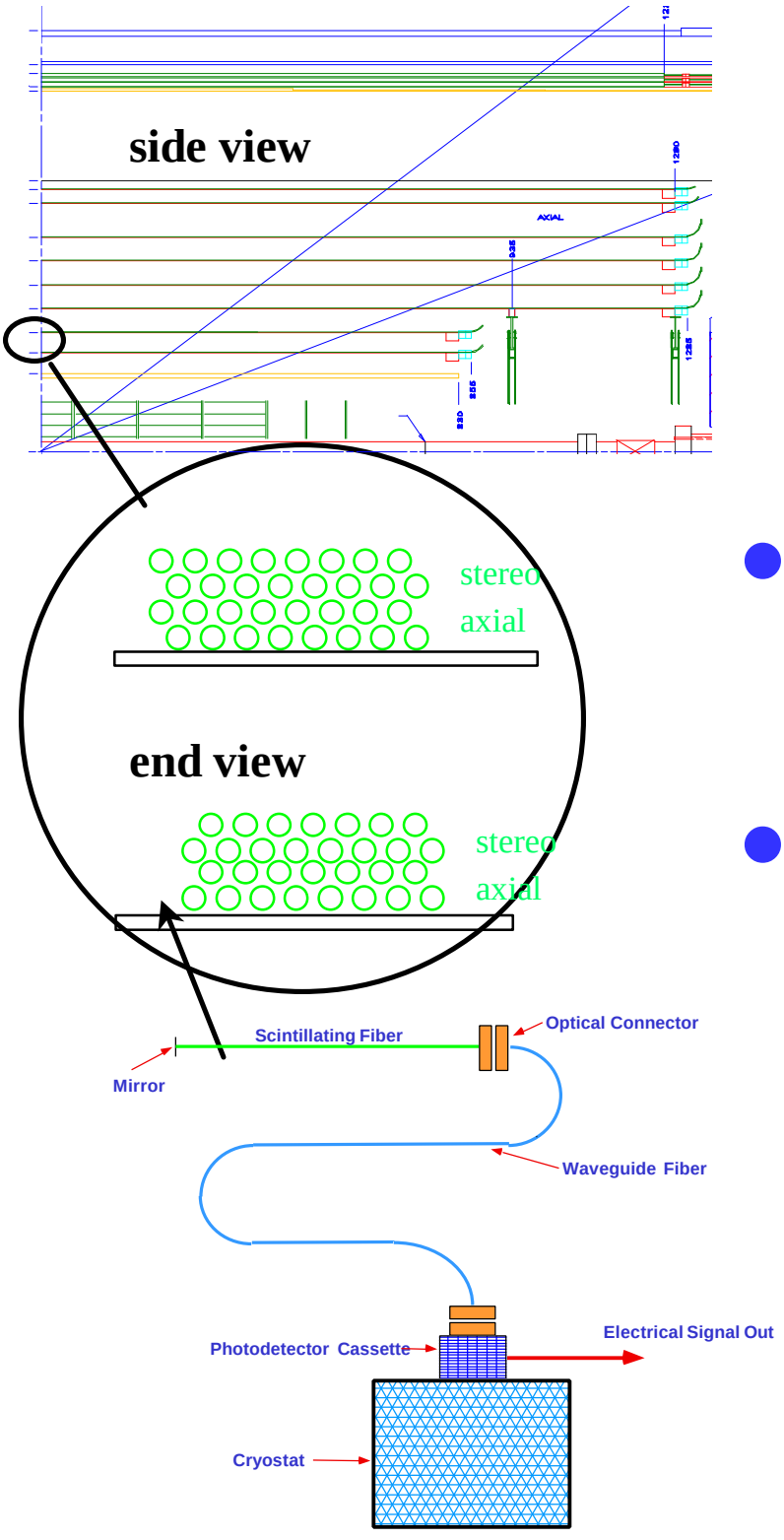
Production capability (machinery & people)

Assembly completed: Feb-17-2000

SMT status in numbers
(example of a weekly status report)

		D0SMT Status 6/9/99				
In Production or complete						
Partial Shipments						
Prototype Production						
HDI Production						
Description	# Needed	Company	%	Last wk	Date Available	Comments
3-chip short	48	Dyconex	100	100%	Dec-98	61 delivered 02/08/99
3-chip long	24	LPC	100	100%	Jan-99	55 delivered 1/10/99
6-chip short	96	Compunetics	0	0%	Jul-99	P.O.
6-chip long	48	Compunetics	42%	0%	Jul-99	P.O (20 pcs 5/28)
9-chip short	144	Speedy Circuits	0	0%	Jun-99	P.O.
9-chip long	72	Dyconex	100%	100%	Mar-99	Complete
6-chip F	144	Compunetics	17%	17%	Jul-99	P.O.
8-chip F	144	Compunetics	28%	28%	Jul-99	P.O.
6-chip H	192	Compunetics	13%	13%	Jun-99	P.O. (230 pcs 5/31)
Detector Production						
Type	# Needed	# Received	%	Last wk	Date Complete	Comments
3 Chip	144	>144	100%	100%	Jun-97	Complete
6 Chip	144	12	8%	0%	Nov-99	Received 11 6/7/99
9 Chip	432	240	56%	49%	Dec-99	
F disk	144	21	15%	7%	Dec-99	
H Disk	384	260	68%	55%	Jul-99	
Module Production						
Type	# Needed	Fixtures	Built	Last wk	Date Complete	Status
3 Chip	72	Complete(2/2)	14	9 (7)	Jul-99	Production (5/wk)
6 Chip	144	Checking	0	0	Dec-99	Prototype
9 Chip	216	Complete (2/4)	16	13 (11)	Jan-00	Production (2-4/wk)
F disk	144	Prototype	0	0	Dec-99	1st elect HDI in test
H Disk	192	Complete(2/2)	3	2 (1)	Dec-99	Production (1-2/wk)
Supports and Infrastructure						
Type	# Needed	% complete	Last wk		Date Complete	Status
Bulkheads	6	100%	100%		Jun-99	Production
F Disk	12	33%	33%		Jun-99	Prototype ok
H Disk	4	100%	100%		Jul-99	Measuring
C fiber cylinder	1	0%	0%		Jul-99	2 prototypes
Test Systems	8	100%	100%		Feb-99	Complete
Assembly and test						
Milestone		% complete			Date Complete	Status
Full Crate Test		100%			May-99	Complete
Barrel Dry Assembly		10%			Jun-99	set-up, alignment
10% Readout system					Jul-99	
Full Barrel/Disk Module					Aug-99	
H Disk Ring					Sep-99	
F Disk Ring					Sep-99	

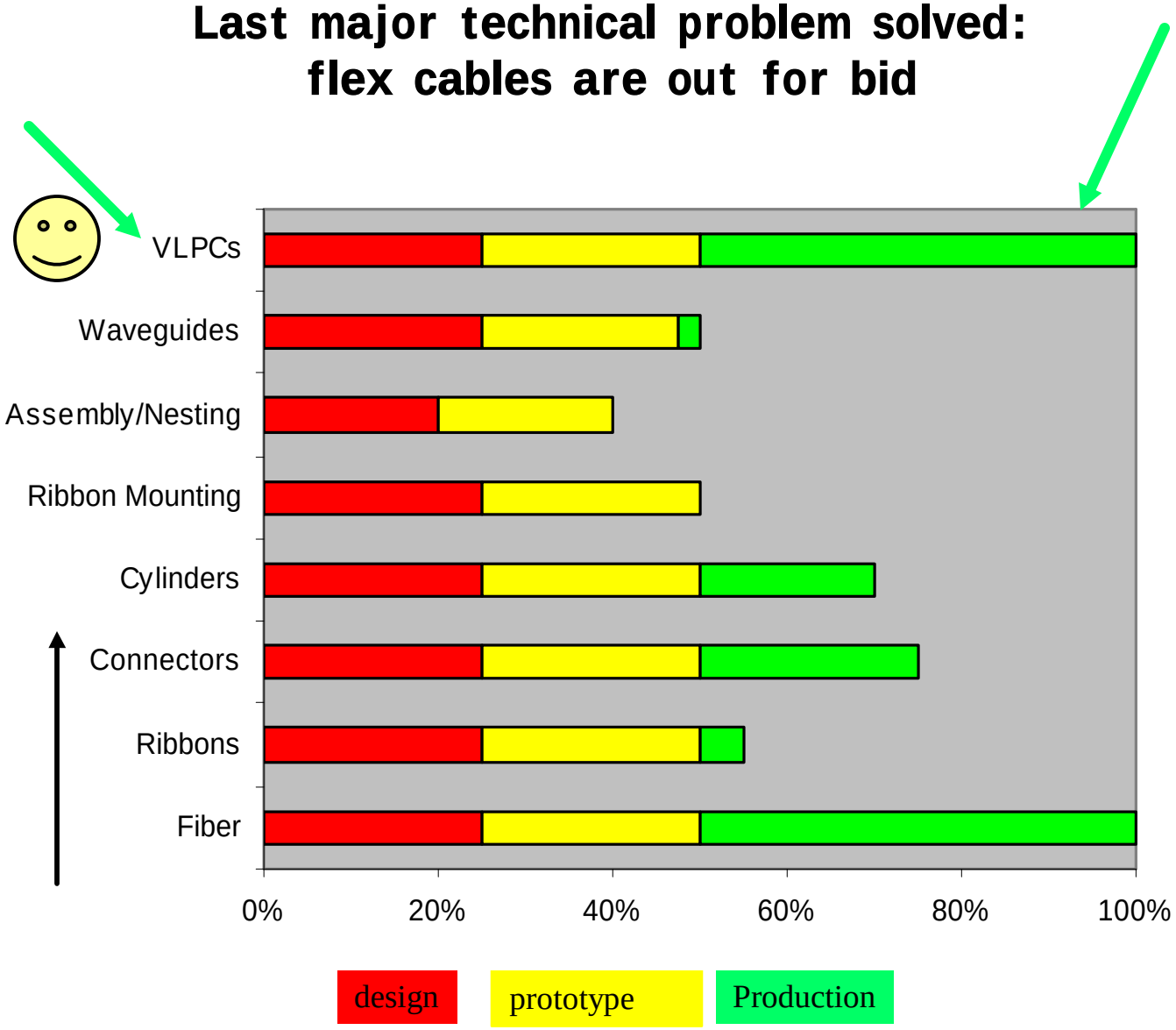
Fiber Tracker Overview



- Scint Fibers
  - 830µm ∅, multiclad
  - 1.6-2.5m active length
  - 10m clear waveguide to photodetector
  - rad hard (100 krad) (10yr @ 20cm @10^{32})
- Fiber Ribbons
  - 8 axial doublets
  - 8 stereo doublets (3^{o} pitch)
- Readout
  - 77,000 channels
  - VLPC readout
  - run at low temp (9 ^{o}K)
  - fast pickoff for trigger
  - SVXII readout

Fiber tracker status

Last major technical problem solved:
flex cables are out for bid



Issues:

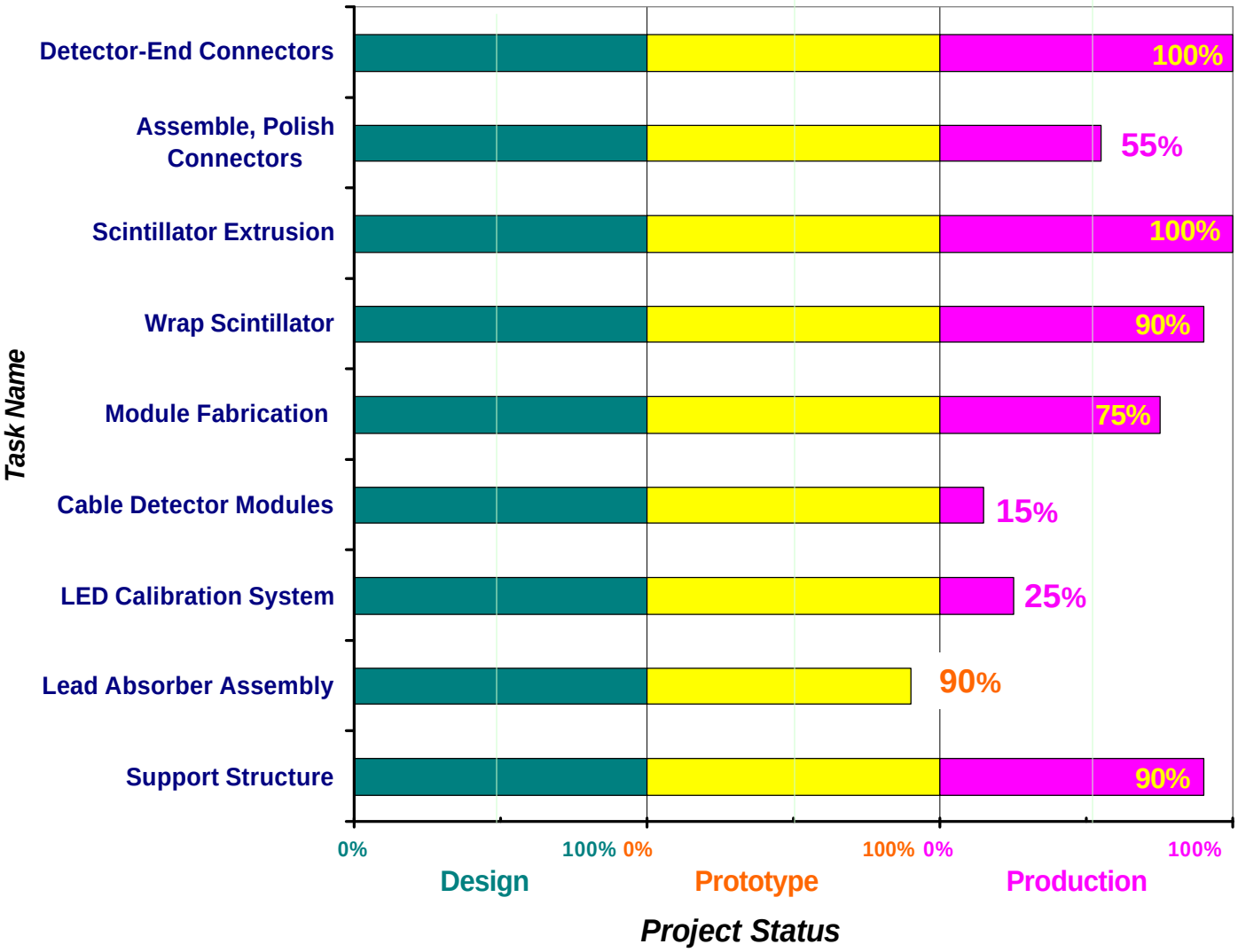
Start production

Production capability (people)

Detector construction, VLPC

Assembly completed: Jan-24-2000

Forward Preshower
Status Report: June, 1999



FPS - South Installed at Fermilab: September 22, 1999
FPS - North Installed at Fermilab: January 14, 2000

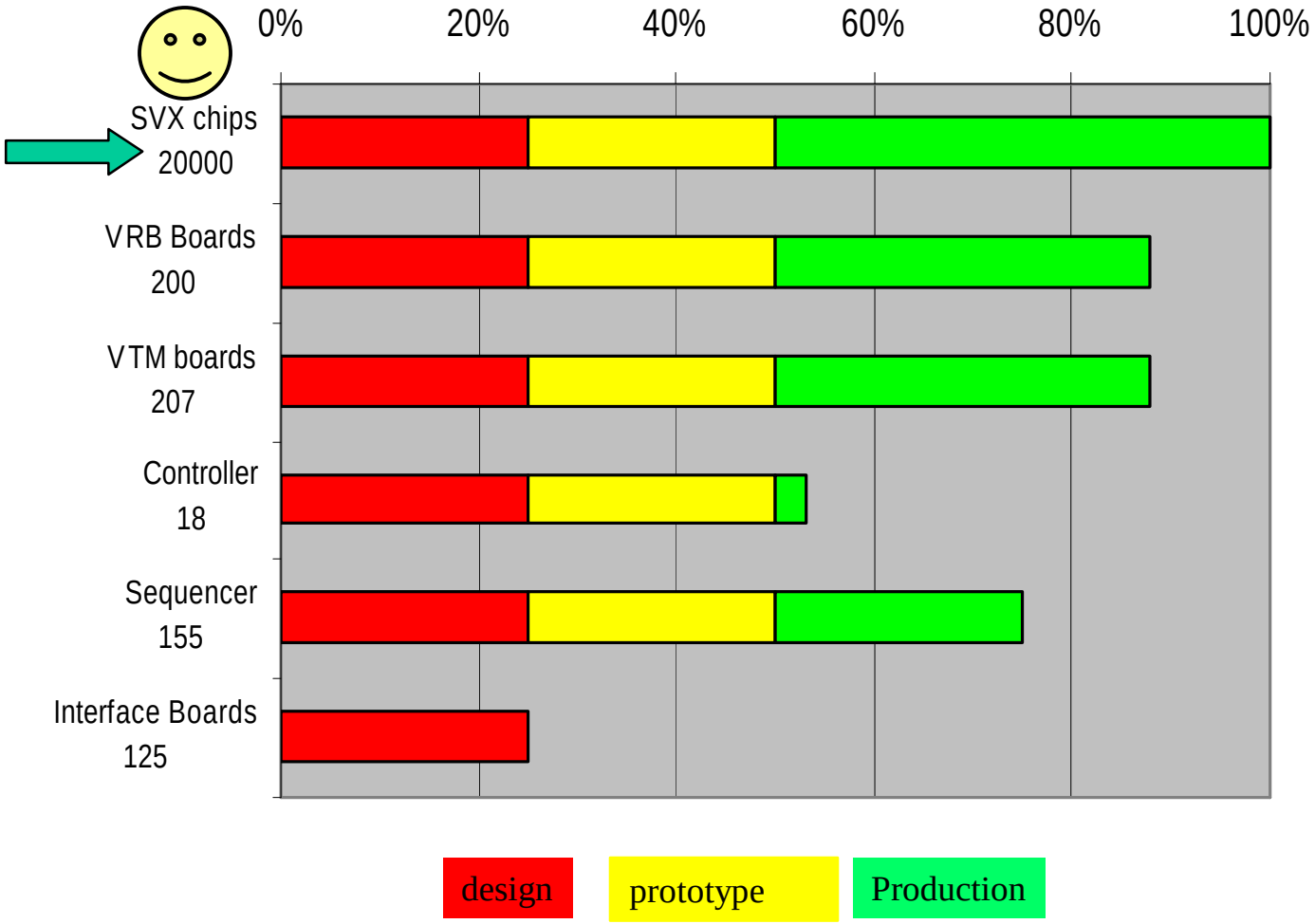
Detector Hook-up Complete:
February 4, 2000 (North), April 18, 2000 (South)

Project on-schedule, no items on critical path.

Central Preshower

- **Detector installed**
- Clear waveguide design nearly complete and waveguide construction will begin soon
- Readout channel mapping is being developed
- Preparation for the cosmic ray test to precise determine the yield is under the way

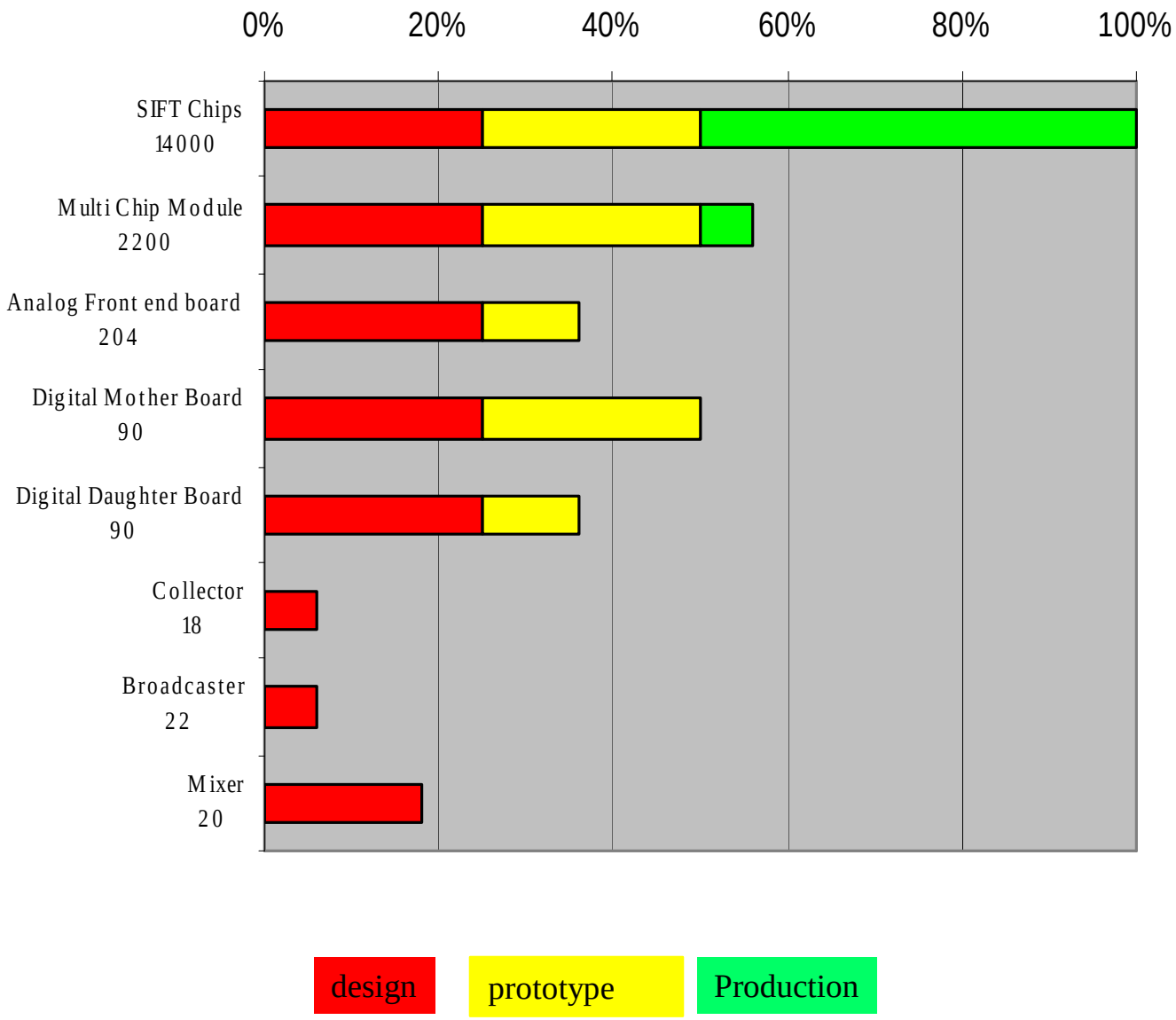
Silicon + Fiber tracker Electronics



SVX II chips & HDI's enable to start production and testing

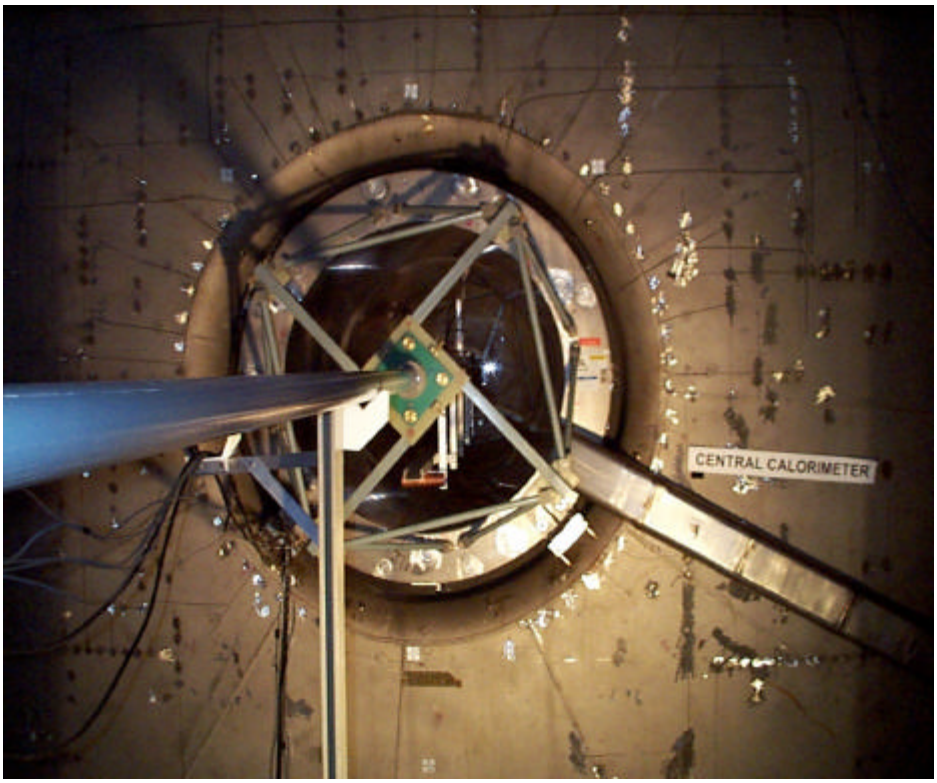
Silicon

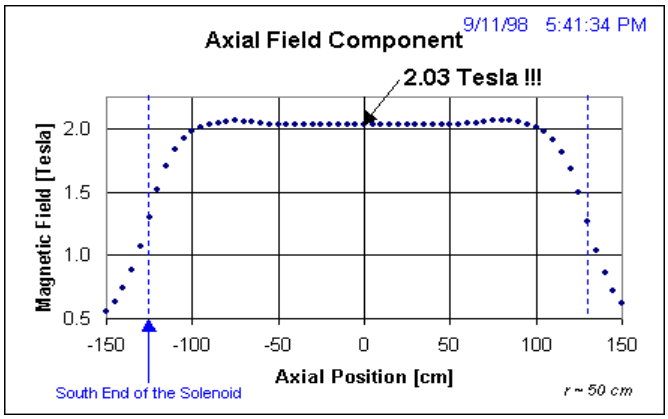
Fiber Tracker Electronics



Includes parts of the Level 1 tracking trigger

Solenoid & Field Mapper in Bore of Central Calorimeter



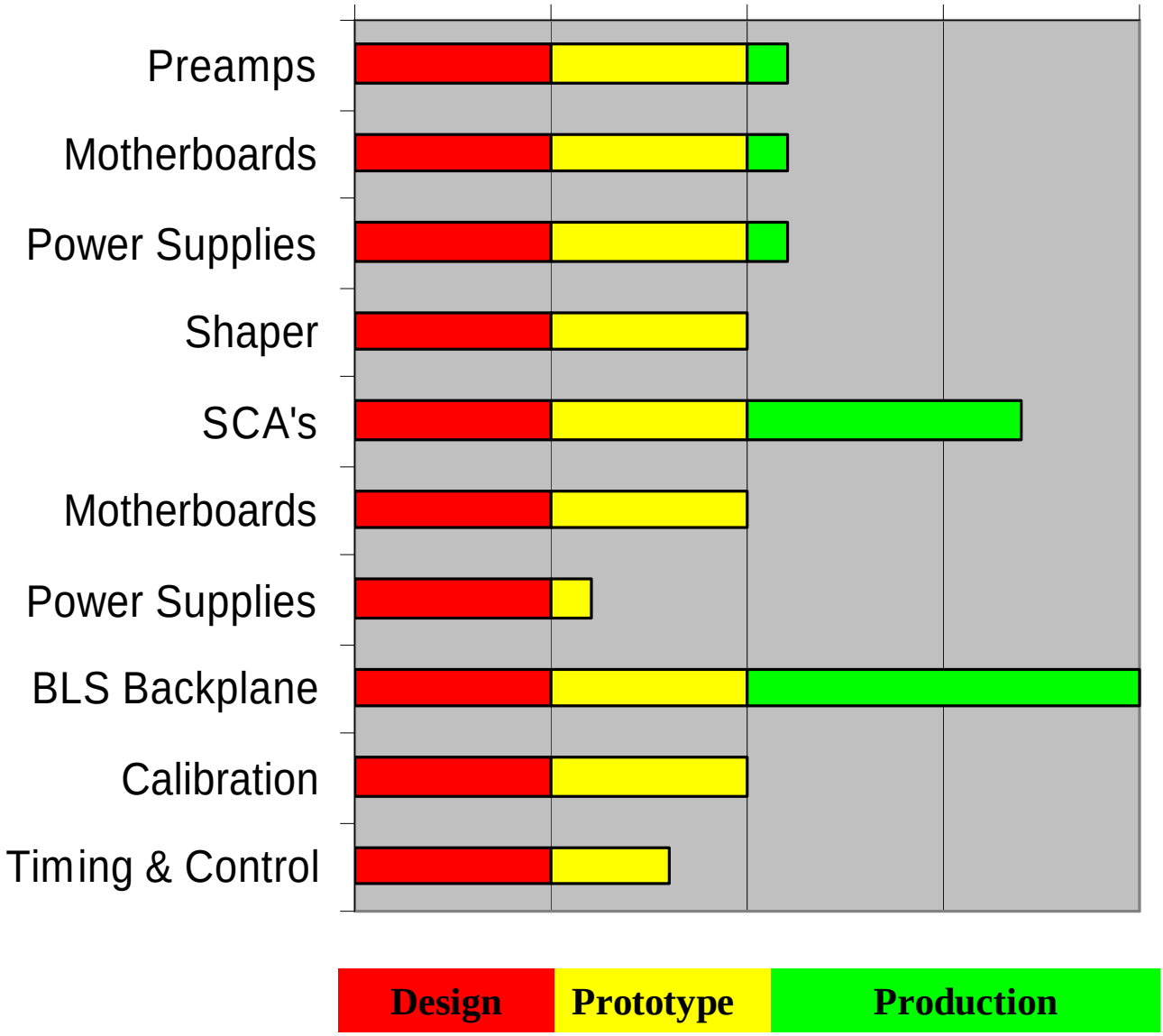


- **Solenoid System Commissioned Sept 1998**
- **Chimney Bus Lower Joint Repaired Jan 1999**
- **Precision Fieldmapping Summer 1999**

DoE Review
June 1999

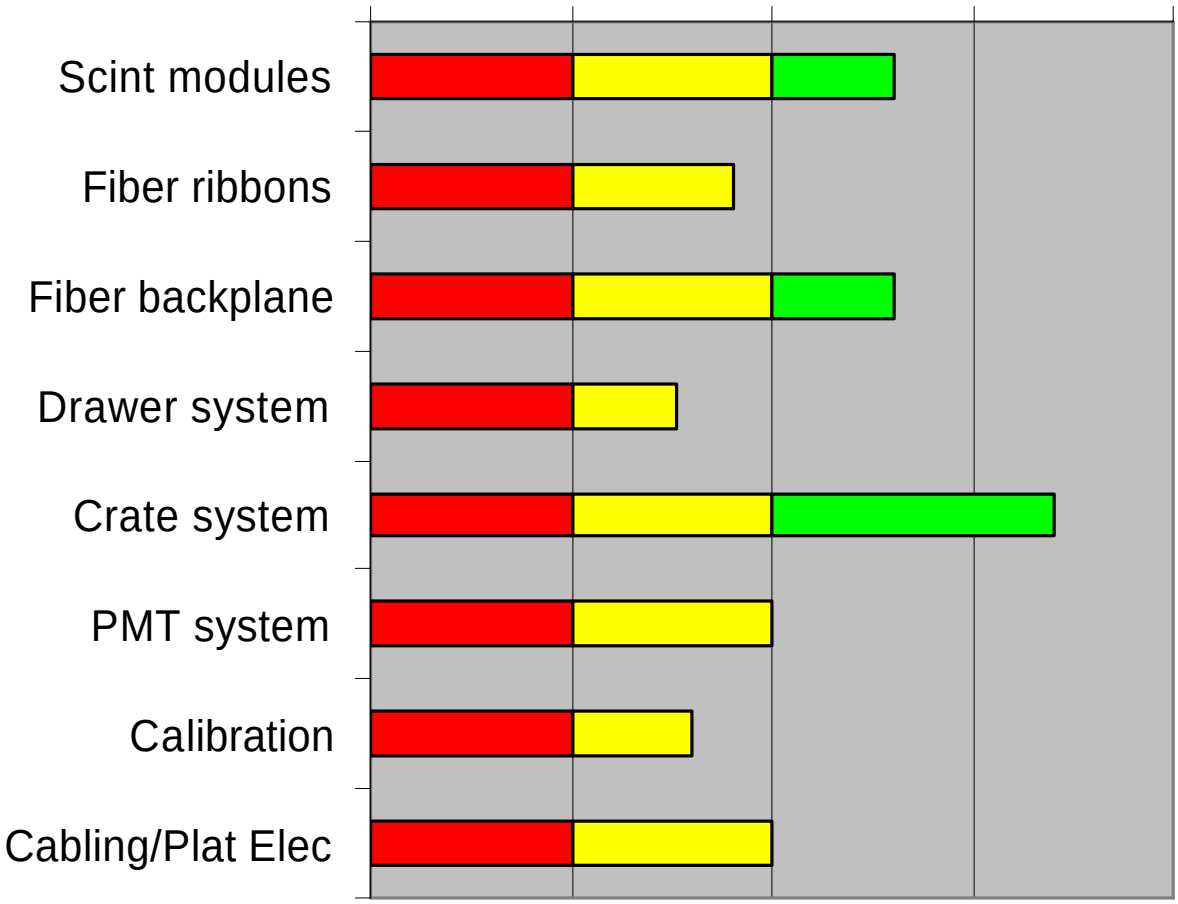
Calorimeter Electronics Status (WBS 1.2.1)

- **Replace 60k channels of preamp, SCA, shaper, calibration, and power supplies**



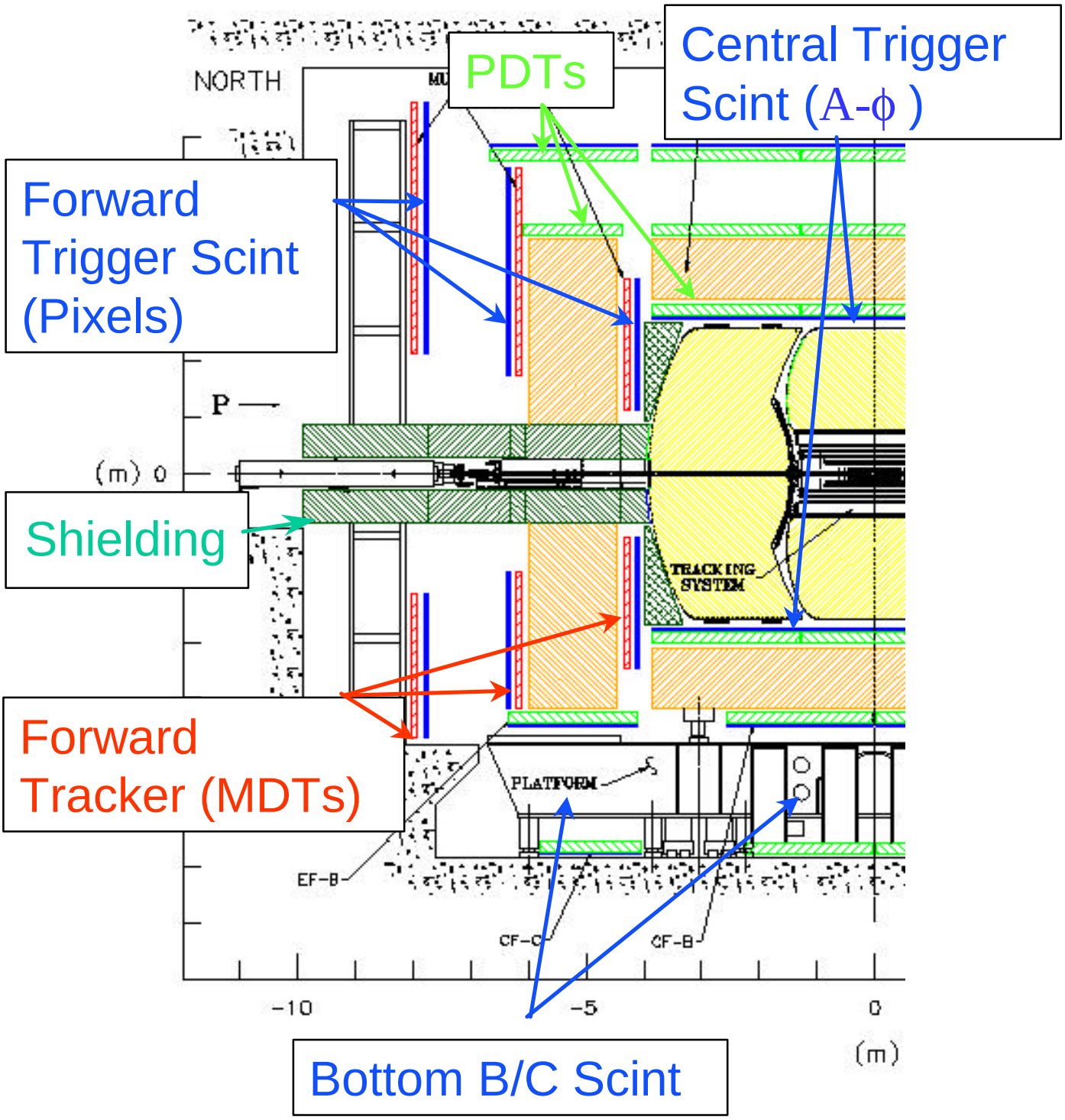
CC, ECN, ECS cryostats
last ECS: finish recabling: Mar-18-2000

Inter Cryostat Detector (ICD)

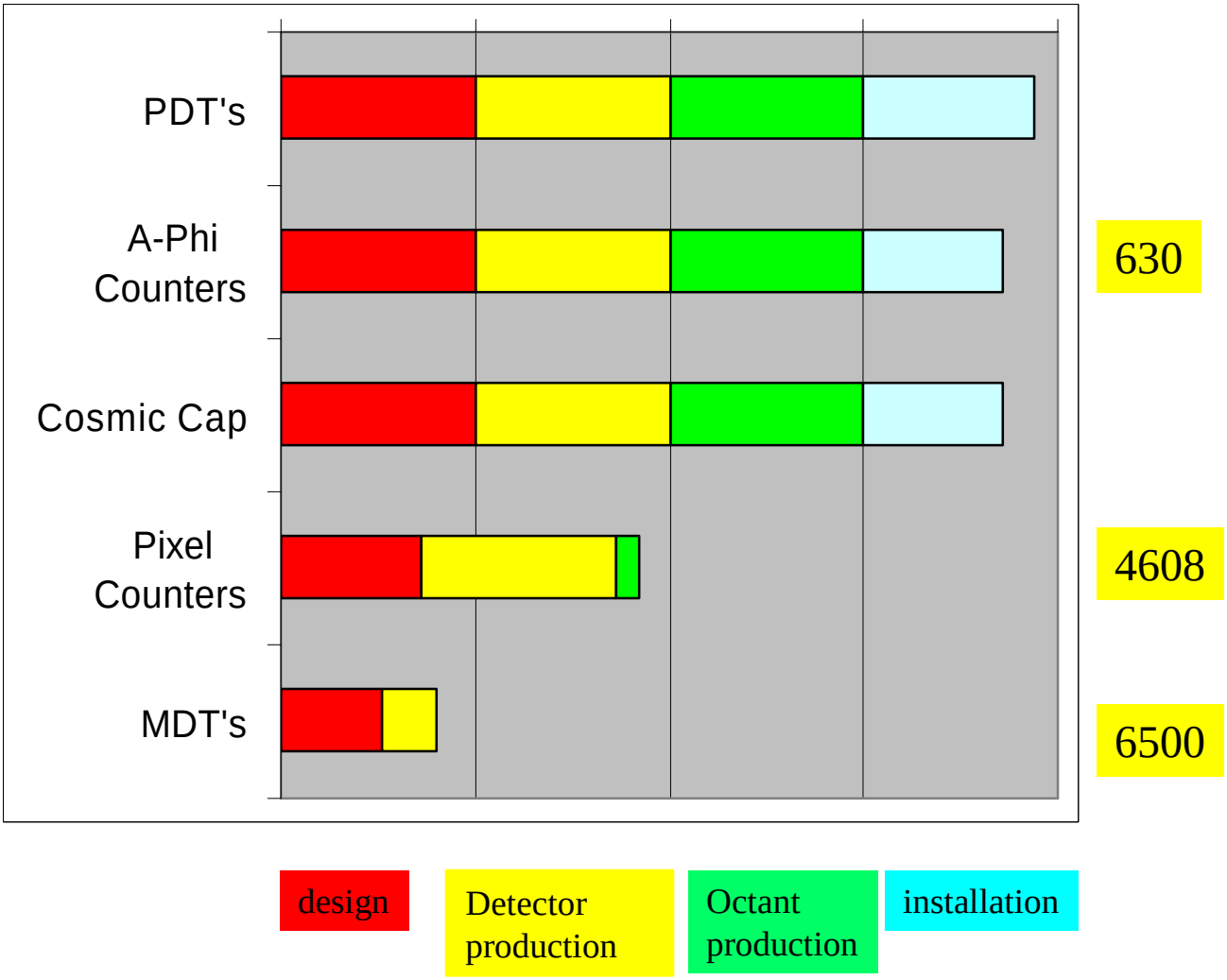


Oct-99: Install North & South ICD
Mar-99: Finish hookup

Muon Detector Upgrade



Muon detector status



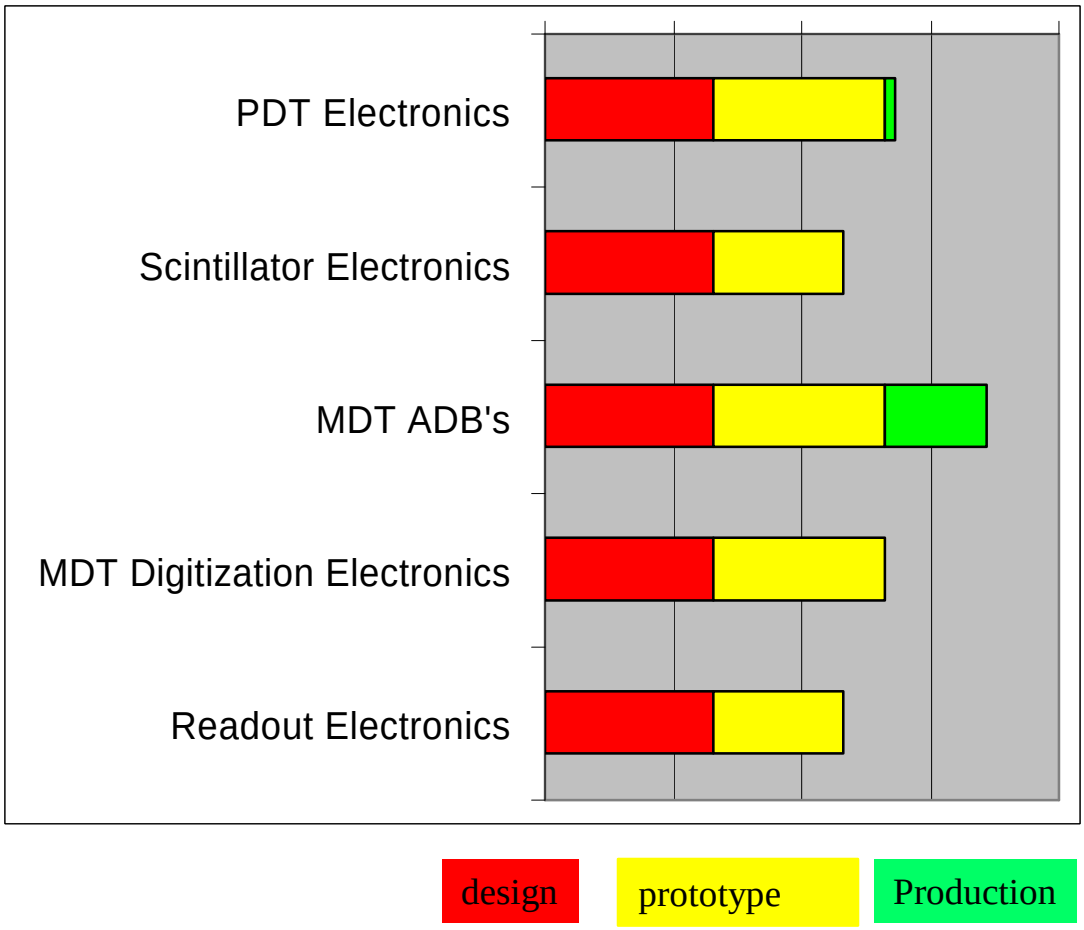
Central muon: complete & driving commissioning

Forward muon:

- MDT production at DUBNA
- Assembly into octants (48 for pixels and 48 for MDT's)
- Installation: BIG pieces

Assembly completed: Jul-10-2000

Muon electronics



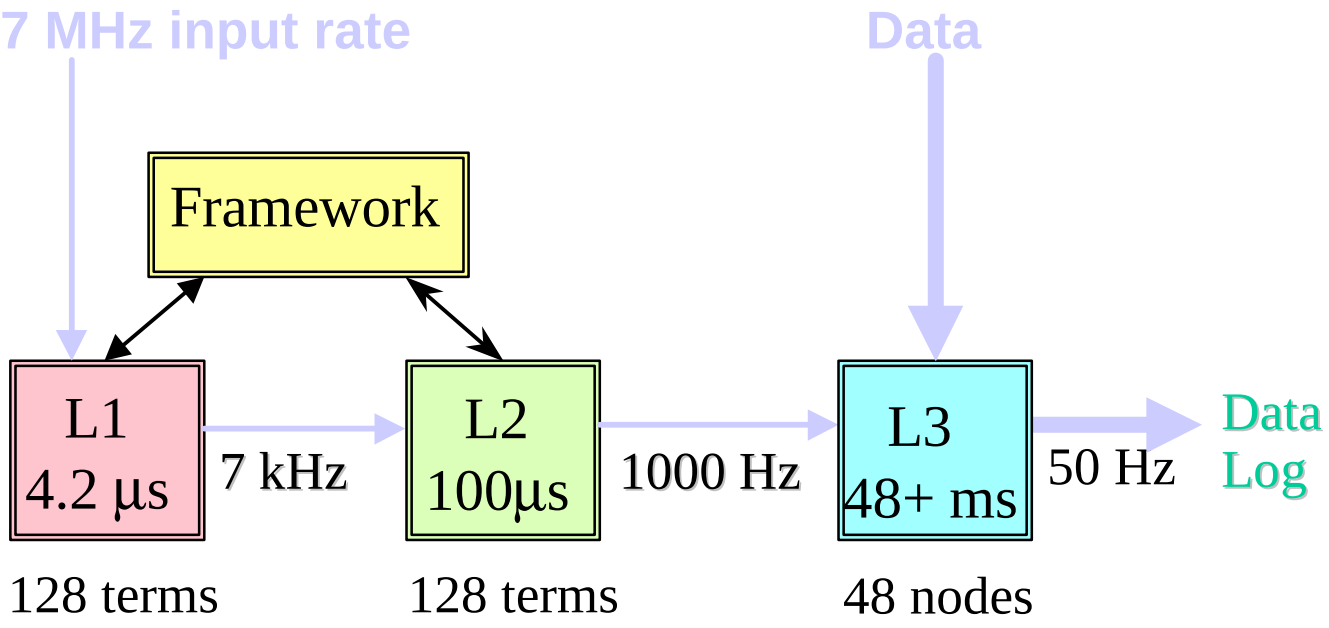
Lab F, E: Forward muon assembly factory

Muon system assembly needs a lot of space.
Provided in Lab F & E.
Both in use.

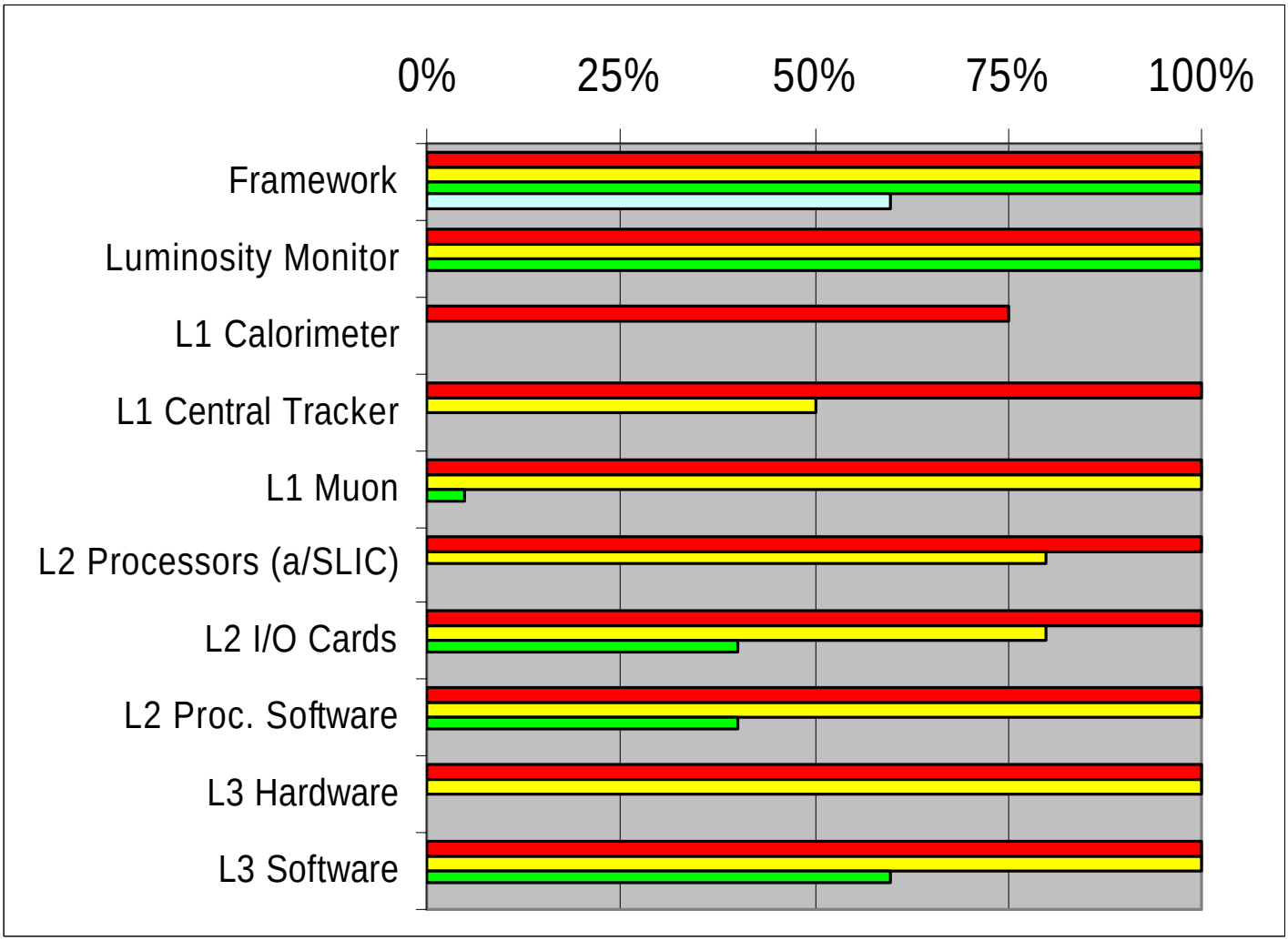
DoE Review
June 1999

Trigger Overview

For $L=2x10^{32}cm^{-2}\ s^{-1}$ (Bunch Crossings at 132 ns; Deadtime: < 5%) :



Trigger Status



design

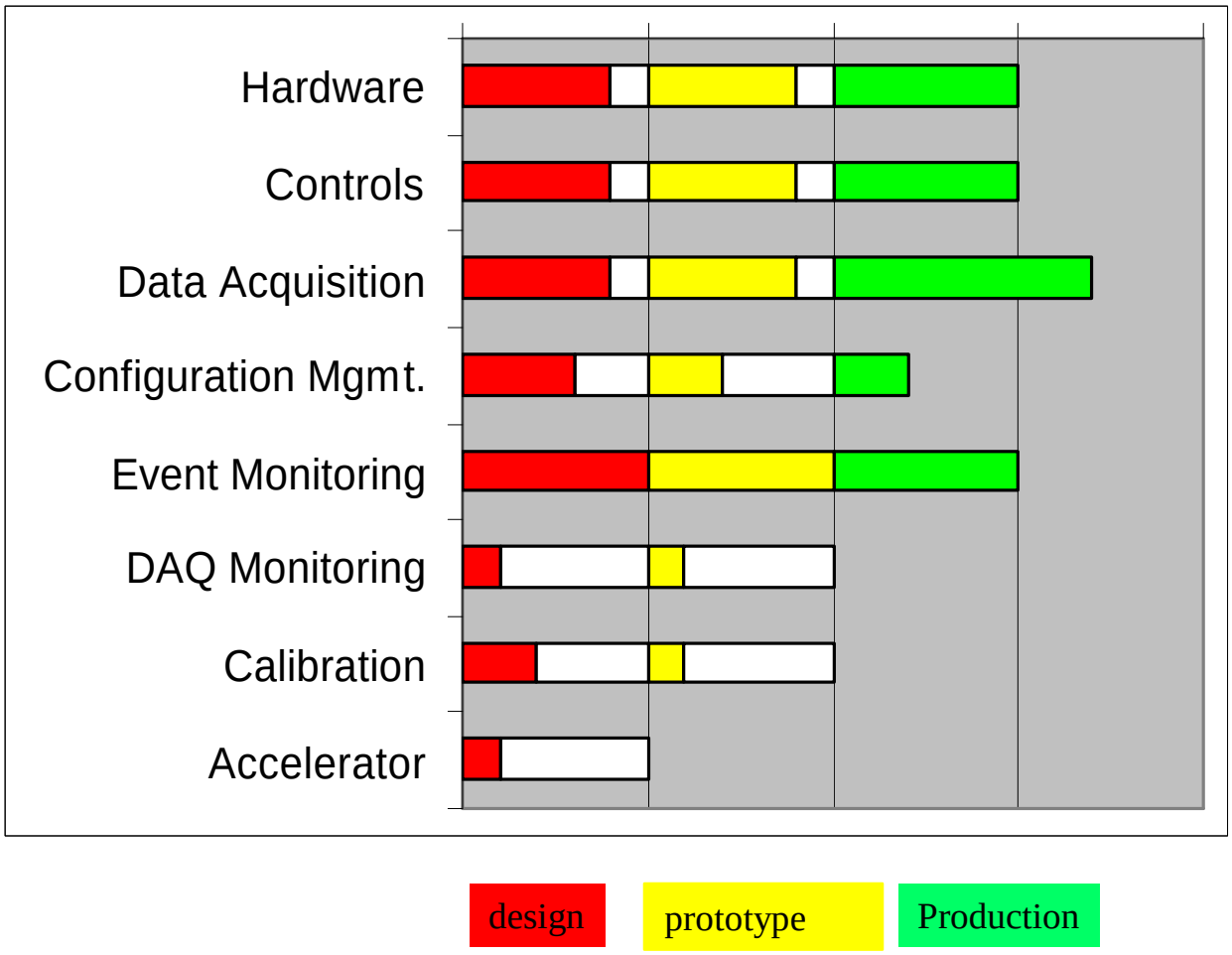
prototype

Production

Commissioning

Not a critical path item for detector completion

Online status



Ready to start commissioning of detector.

Critical pieces available to start:

- Controls
- DAQ & Event Monitoring

Installation & Commissioning

- **No status chart**
- **Installation has started already**
  - more details from J.Kotcher
- **Commissioning**
  - starting with central muon system
  - in assembly areas
    - **silicon 10% test**
    - **cosmic ray test fiber tracker**

Summary of status & issues

Last technical problems: Flex circuits (CFT) and HDI (SMT) solved

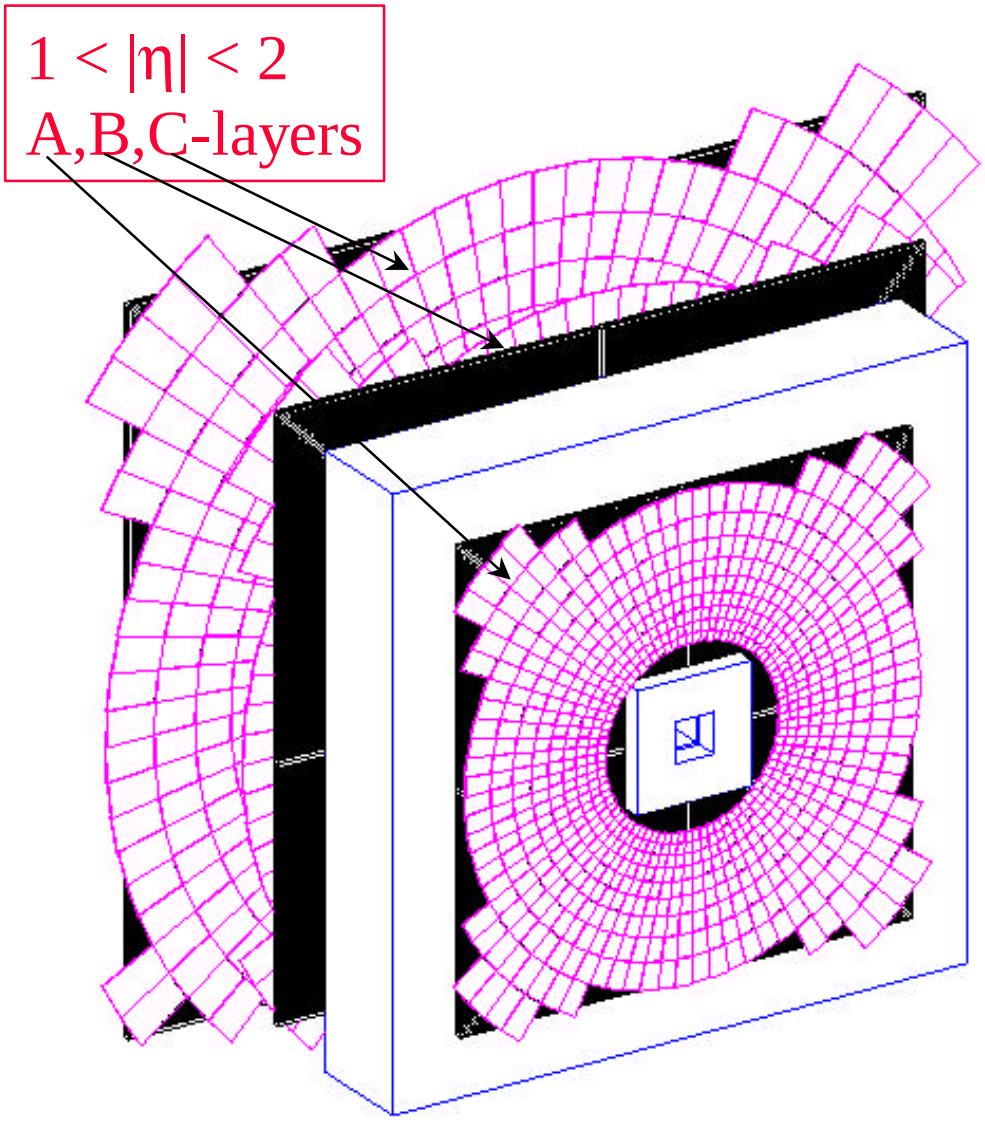
Issues summary:

- Silicon Sensor delivery schedule
- Start mechanical production of Fiber Tracker
- Maintain production schedules of trackers (SMT,CFT)
- Roll in ready date: May 15, 2000 ==> success oriented schedule

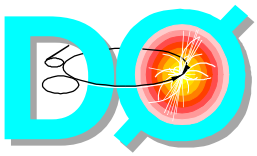
Not explicitly mentioning all the successes & progress, detectors/parts complete, electronics in hand & tested.

Not mentioned software & computing:
Von Rueden review last week
Status: very good

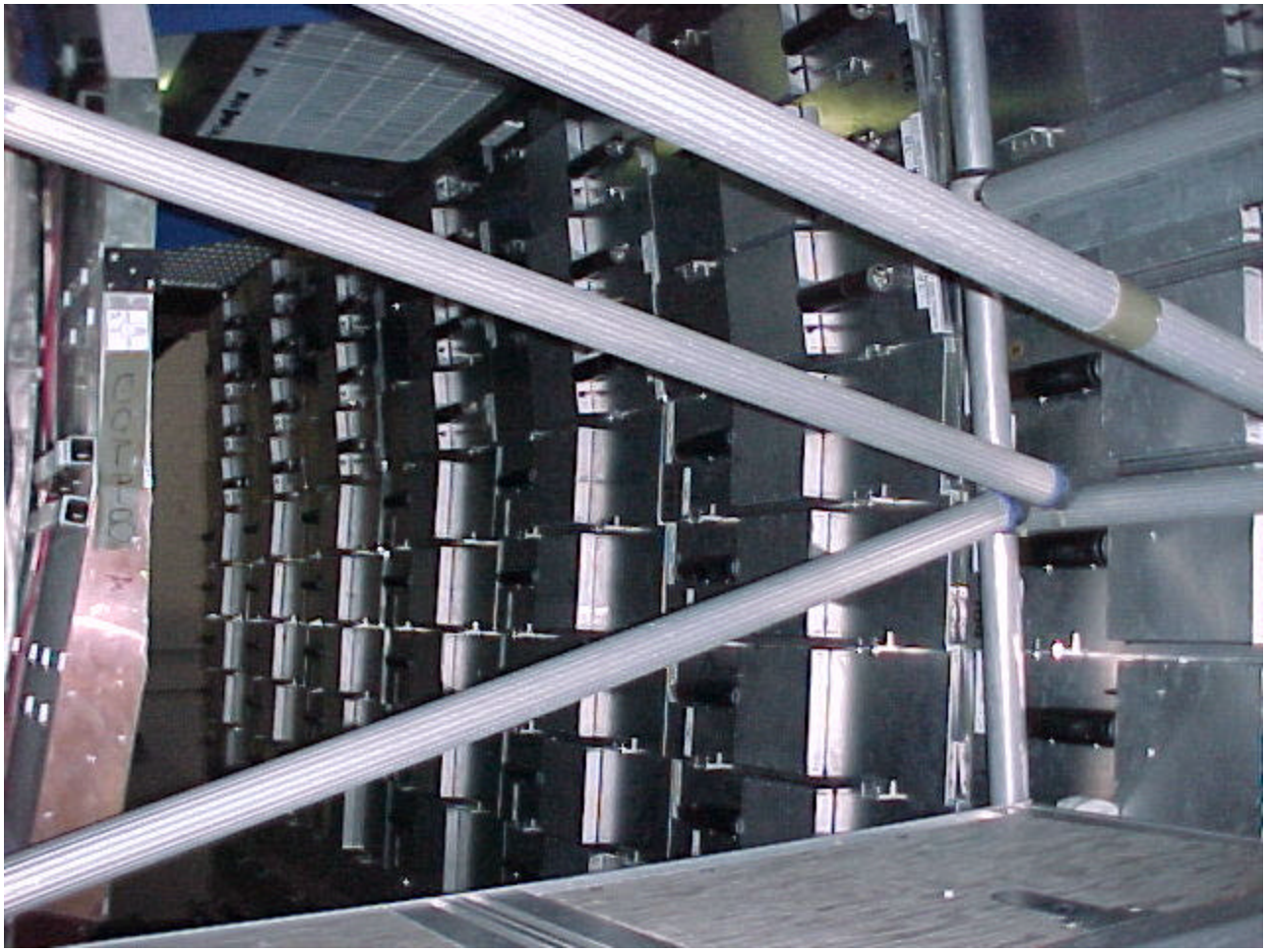
Muon Forward Trigger detectors



- 4608 counters
- 3 layers to reduce combinatorics
- Counter sizes $\Delta\eta$ x $\Delta\phi$ = 0.1 x 4.5°



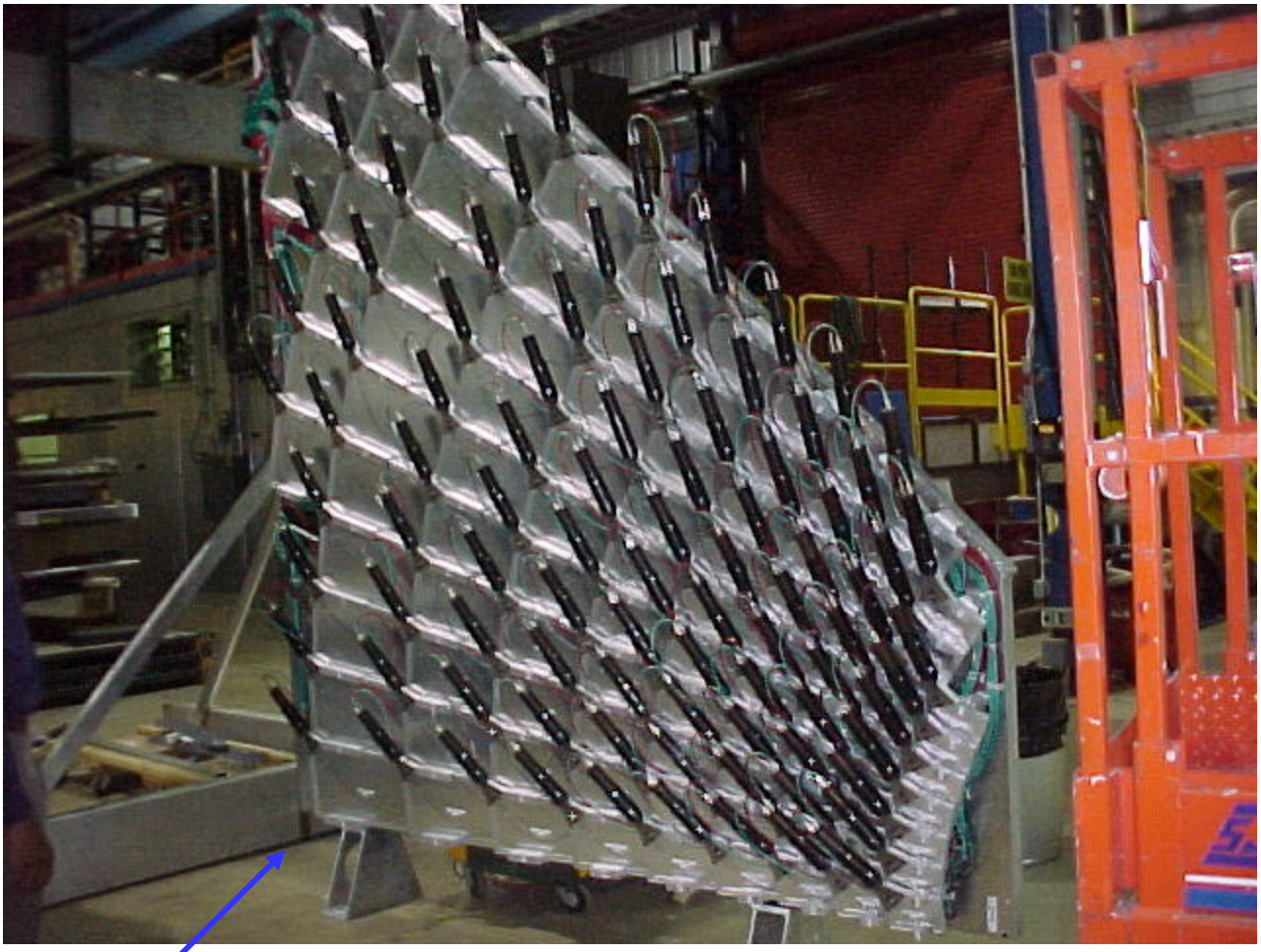
(enable trigger on low P_t muons)



630 counters, built at ITEP, Russia & NIU, US
all counters tested & installed

DoE Review
June 1999

Forward Muon Trigger Pixel octant from A Layer

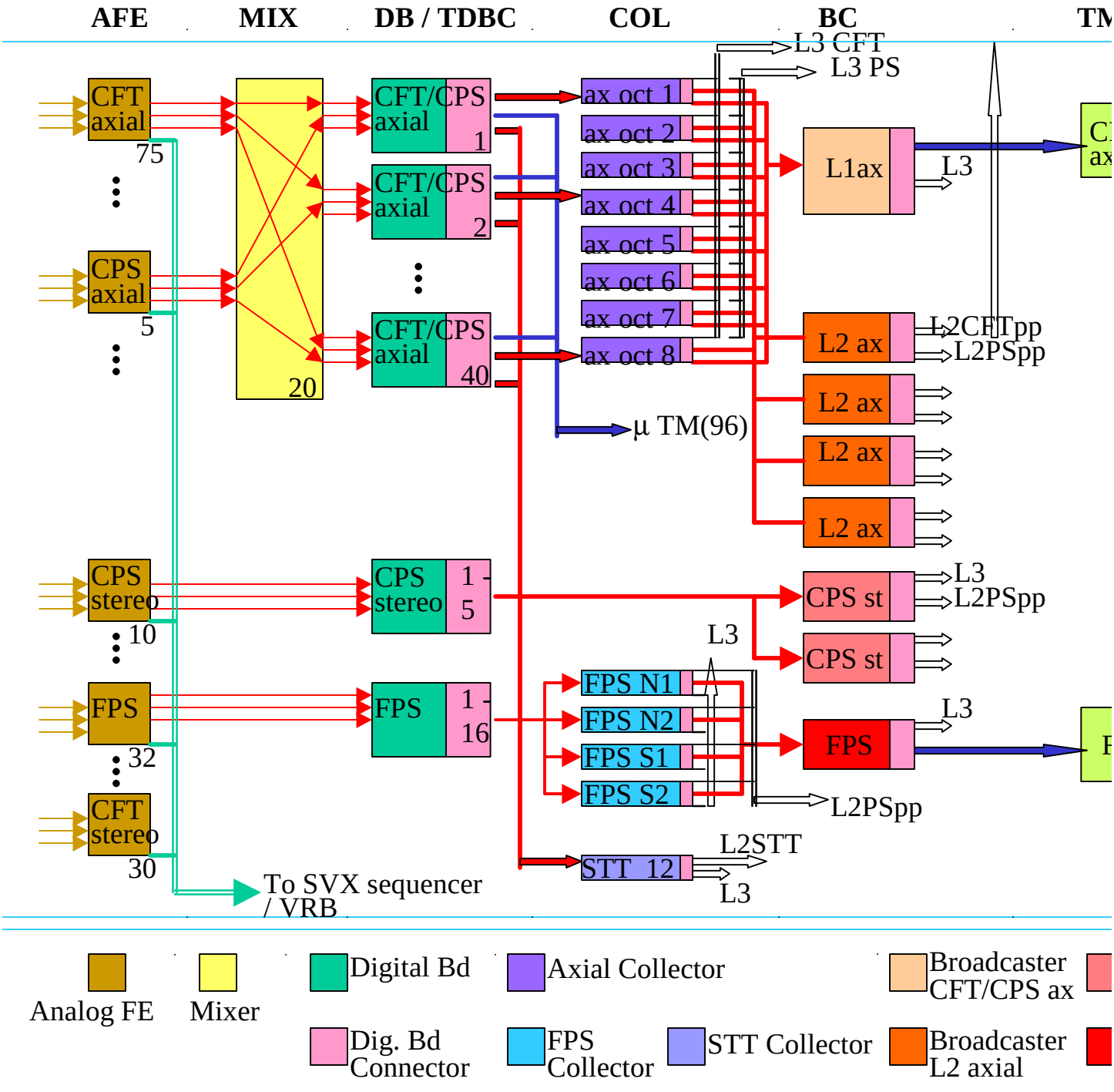


Lab F production facility

Picture of first complete & cabled

Need to build 48 octants; total 4608 counters

DoE Review
June 1999


AFE
MIX
DB / TDBC
COL
BC
TM
CFT axial
75
CPS axial
5
20
CFT/CPS axial 1
CFT/CPS axial 2
CFT/CPS axial 40
ax oct 1
ax oct 2
ax oct 3
ax oct 4
ax oct 5
ax oct 6
ax oct 7
ax oct 8
L3 CFT
L3 PS
L1ax
L3
L2 ax
L2 ax
L2 ax
L2 ax
L2CFTpp
L2PSpp
μ TM(96)
CPS stereo
10
CPS stereo 1 - 5
CPS st
CPS st
L3
L2PSpp
FPS
32
FPS 1 - 16
FPS N1
FPS N2
FPS S1
FPS S2
FPS
L3
L2PSpp
CFT stereo
30
STT 12
L2STT
L3
To SVX sequencer / VRB
Analog FE
Mixer
Digital Bd
Axial Collector
Broadcaster CFT/CPS ax
Dig. Bd Connector
FPS Collector
STT Collector
Broadcaster L2 axial